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THESIS

NEGOTIATION SUPPORT SYSTEM'S IMPACT ON THE
SOCIO-EMOTIONAL ENVIRONMENT:
A RESEARCH DESIGN FRAMEWORK

by

John B. Owen

March 1992

Thesis Advisor:

Tung X. Bui

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Negotiation Support System's Impact on the Socio-emotional Environment:
A Research Design Framework

by

John B. Owen
Lieutenant, United States Navy
B.A., Jacksonville University, 1985

Submitted in partial fulfillment
of the requirements for the degree of

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March 1992

ABSTRACT

The goal of this thesis is to examine the negotiation/conflict environment and develop some proposed effects that Negotiation Support Systems (NSS) have on the socio-emotional climate. This introduction of NSS into the negotiation cycle is expected to change the way in which bargaining parties interact. Normative and socio-emotional biases, while not completely eliminated, may be controlled and limited to a degree. This study suggests that shared use of NSS during negotiation helps users by structuring the session to better refine the party's objectives and tactfully convey them to the other party. Additionally, through better appreciation of the strengths and weaknesses of the other party's position and arguments, interest differentials may be identified more quickly and thus negotiations may move towards a more integrative solution. A proposed research design is presented to evaluate whether use of NSS can *improve* resource consumption, decision quality, perceived fairness, perceived satisfaction, and working relationships.

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I. INTRODUCTION

With the increasing interaction of people in a global community, the role of negotiations has expanded in both complexity and criticality. These developments demonstrate the need for negotiating agreements of better quality and at quicker speeds to keep up with the growing demands of today's negotiating parties. The often conflicting goals of better agreements in a shorter time have become increasingly achievable by the introduction of modern computing tools and negotiation support software. These Negotiation Support Systems (NSS) are interactive, computer-based tools intended to aid negotiating parties in reaching agreement through support of information exchange while eliminating communication barriers among parties. Additionally, by providing techniques for structured decision analysis and by controlling the patterns and timing of negotiations, more integrative outcomes are expected (Jelassi & Foroughi, 1989).

This thesis is intended to develop and explore the effect NSS may have on the process and outcomes of negotiations. Through research of current negotiation and conflict literature, several possible effects of NSS have been proposed. While this thesis does not perform actual experimental study, it focuses on the development of a theoretical framework and the identification of some of the

variables and possible measures for use in subsequent research.

Section II provides a general description of the negotiation process and conflict environment. Section III provides an assessment of current NSS structure, processes and capabilities. Section IV provides a theoretical discussion of conflict and the socio-emotional environment present between negotiating parties. Section V discusses requirements and expectations for NSS and identifies some of the anticipated effects NSSs have on party's perceptions of decision quality, fairness, resource consumption, satisfaction, and working relationships. Section VI develops proposed measures and experimental settings for evaluating these expectations. Section VII provides concluding and summary remarks.

II. THE NEGOTIATION ENVIRONMENT

A. CONFLICT

Conflict has been defined as "the process which begins when one party perceives that the other has negatively affected, or is about to negatively affect, something which he or she cares about" (Thomas, 1992, p7). This definition captures the idea that it is an ongoing sequence of events, between at least two parties that have a degree of interdependence and interaction, and there is a perception that there is some incompatibility of concerns between them. These conflicts are often addressed through negotiation, which has been defined as "a process for resolving conflicts between two or more interdependent parties. Activity is mixed-motive (in that parties are motivated to cooperate and compete with one another)" (Anson & Jelassi, 1990). Models of the negotiation process include many general assumptions about human behavior, including the strong influence of economics. That is, parties have been assumed to choose behaviors based upon their perceived likelihood of attaining desired outcomes. Also, the desirability of outcomes has tended to be based on narrow notions of self-interest (Thomas, 1992, p14).

These general assumptions, however, ignore internalized concerns about social/normative issues (Thomas, 1989). These

concerns consider the morality and ethicality of the means chosen to achieve a given end. Economic assumptions also tend to ignore the interaction of emotion and their potentially strong effects upon thoughts and actions.

This is significant in that a party's thoughts and emotions are particularly important in the negotiation process. They define the party's subjective interpretation of reality and help determine a party's intentions. As such, these emotions are often the target of influence attempts during the negotiation process both by the other party and by the intervention of a third party or mediator.

The foundation for each party's thoughts and emotions involves that party's definition of *the conflict issue* (i.e., deciding what the conflict is all about) and identifying some general possible outcomes. A party defines the conflict issue in terms of the primary concerns of each party. This definition of the conflict issue often suggests some possible settlements or outcomes. There is a limit, however, to the number of possible settlements that a party can be aware of based on human limitations, and usually these settlements provide only a superficial notion of acceptability to each party.

A party's conceptualization of possible settlements has been mapped on the *joint outcome space* shown in Figure 1 (Thomas, 1992, p23). The axes represent the degree to which an outcome would satisfy their own and the other party's

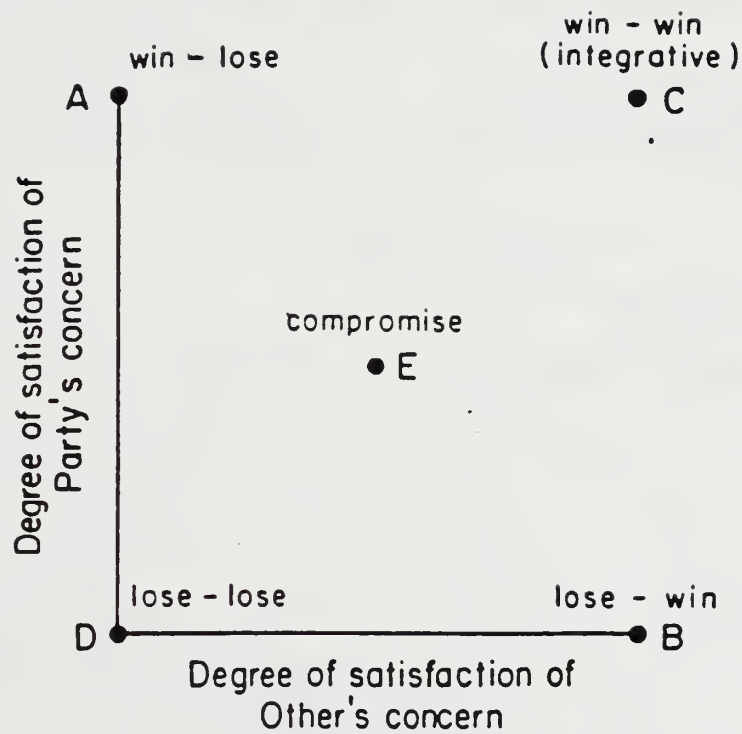


Figure 1: Joint Outcome Space
(Thomas, 1992)

concern. Point C represents a settlement that satisfies the concerns of both parties in an "integrative" (Follett, 1941) or "win-win" (Filley, 1975) outcome. Point D represents a "lose-lose" settlement, with neither party being satisfied. Points A and B represent one party's satisfaction at the expense of the other party's dissatisfaction, "win-lose/lose-win" (distributive outcome). Point E is a compromise, with both parties gaining some but not complete satisfaction with the settlement.

B. NEGOTIATION BEHAVIOR

Negotiation behavior can be described in terms of the portion of the joint outcome space toward which the party intends to move (see Figure 2). These conflict-handling orientations at the strategic level are classified and plotted along two basic dimensions of intent: *assertiveness*, the extent to which a party tries to satisfy its own concerns; and *cooperativeness*, the extent to which a party tries to satisfy the other party's concerns. Along these two dimensions are five strategic intents toward which a party may strive: competing, accommodating, collaborating, compromising, and avoiding (Thomas, 1992). These bargaining styles affect the degree to which an integrative (win-win), distributive (win-lose), or in-between solution is pursued.

A *competing* intention (uncooperative, assertive) is an attempt to prevail or satisfy one's own concerns at the

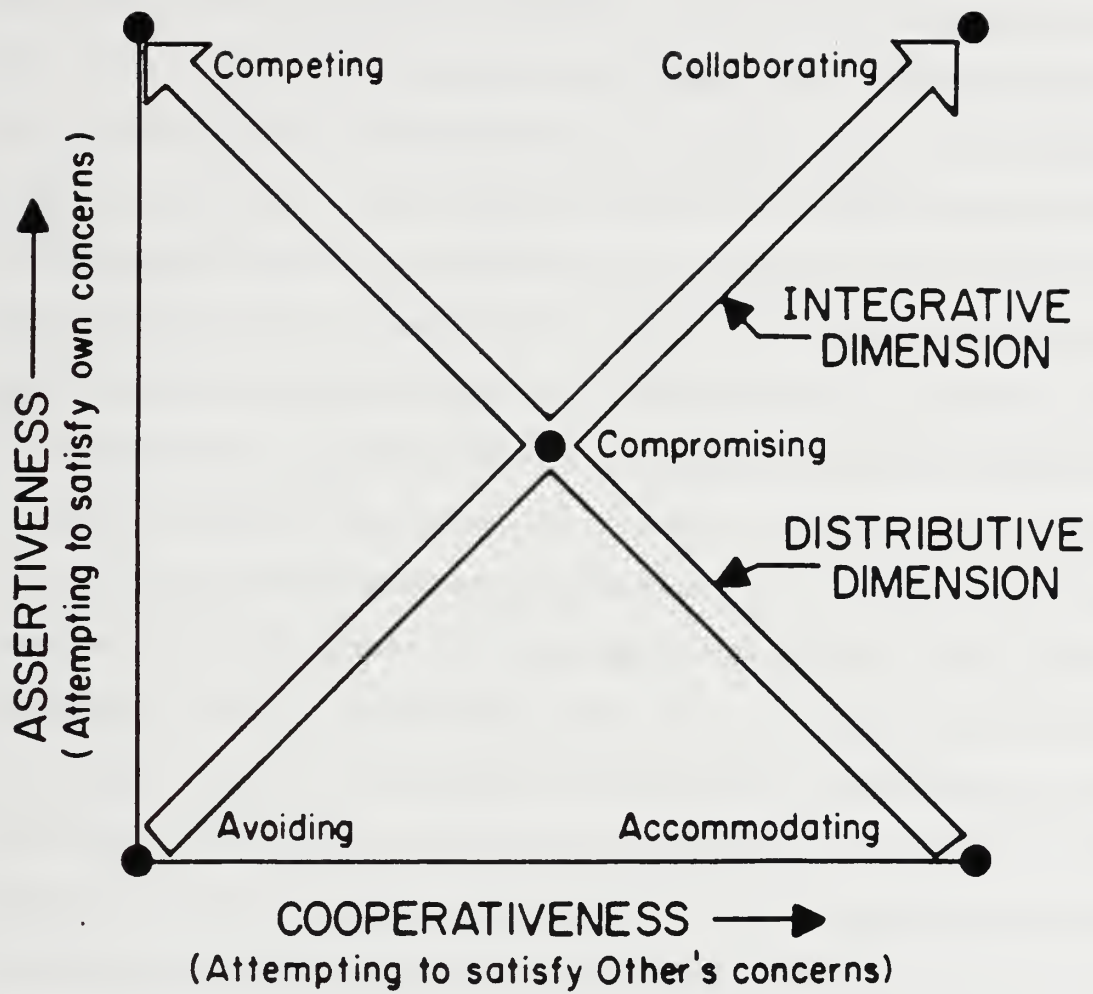


Figure 2: Integrative and Distributive Dimensions of Intent (Kilmann & Thomas, 1975)

other's expense. *Accommodating* intentions (cooperative, unassertive) involve trying to satisfy the other's concerns at the expense of one's own. *Compromising* intentions (between cooperativeness and assertiveness) are an attempt to gain moderate but not complete satisfaction for both parties. In these three types of orientations both parties are proceeding strictly from a fixed-pie, distributive, or zero-sum point of view. The distributive dimension of intent deals roughly with the proportion of satisfaction going to each of the parties. It deals with partitioning of a fixed pie. Willingness to explore alternative avenues, which would expand the pie, on the other hand, is the essence of the integrative dimension of intent. The integrative dimension looks at the total or joint degree of satisfaction of the two parties. At the top end of this dimension, *collaboration* (assertive, cooperative) looks for alternative solutions that would satisfy both parties' concerns completely. At the low end of this dimension, *avoiding* intentions (uncooperative, unassertive) represent the orientation to ignore or neglect the concerns of both parties. Most of the attention of negotiations researchers has focused on distributive (competitive) and integrative (collaborative) bargaining processes.

1. Distributive Bargaining

In a distributive bargaining session each party wants ideally to have the whole pie at the other party's expense

(that is, their intentions are presumed to be competitive.) They also have a minimum "resistance point" (Walton & McKersie, 1965), which is a point of minimum acceptability--the point at which the party would break off the negotiations rather than continue and accept a less favorable settlement, (see Figure 3). Each party's resistance point and their target point define the ends of their "aspiration range". If there is any overlap between the aspiration ranges of the two parties, this overlap is called the "settlement range." This is the range from which possible settlements can be drawn when trying to reach an outcome.

Pursuing distributive tactics leads a party to try to motivate the other party to accept a settlement as close as possible to the party's own target. One of the tactics used to achieve this is to try to convince the other party that they will never achieve their own target or it will be too costly. This encourages the other party to feel they will be better off accepting a settlement close to the party's own target.

2. Integrative Bargaining

Integrative bargaining is contrasted with distributive bargaining in that both parties work together to increase each other's total satisfaction. To achieve an integrative settlement the underlying concerns of both parties must be revealed in some detail, a list of possible alternatives must

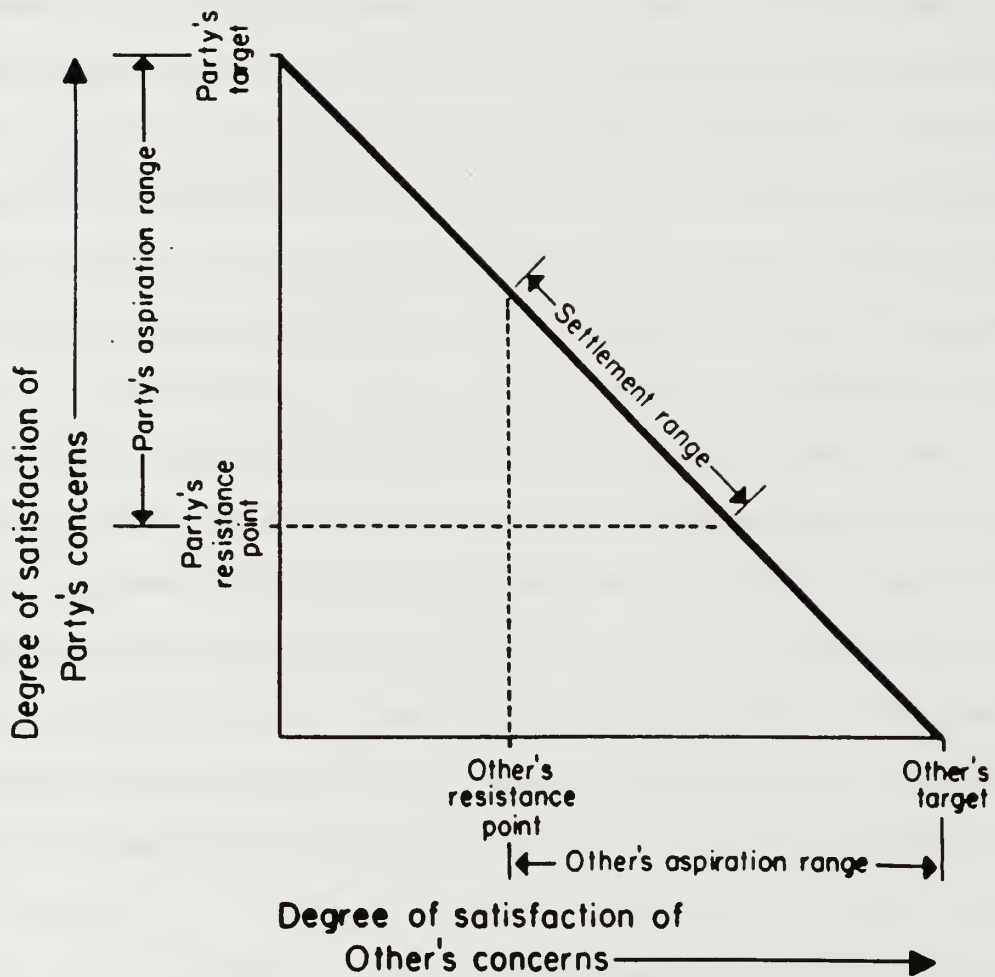


Figure 3: Range of Possible Outcomes in Distributive Bargaining Projected Onto Joint Outcome Space (Thomas, 1992)

be generated, and the most jointly satisfactory alternative must be agreed upon by both parties. The exchange of a party's goals or concerns requires a degree of trust that the other party will not use that information for competitive gain, and as a recipient of that information, trust that the information is accurate and not slanted or padded. The generation and selection of outcomes also requires a degree of flexibility among the parties. This exploratory nature is necessary to truly generate many possible solutions.

C. ISSUE ASSESSMENT

Many conflict researchers express concern that parties often fail to recognize the existence of an integrative "win-win" outcome and pursue instead a more distributive "win-lose" outcome. An important factor in this regard is the way the party defines the negotiation issues. Thomas (1976) has identified three important dimensions of issue definition: 1) egocentricity, 2) insight into underlying issues, and 3) the size of the issue. "Egocentricity" refers to defining the issue solely in terms of one's own concern. By focusing on a party's own concern, egocentric perceptions often generate either/or sets of alternatives, and thus "win-lose" settlements. A second factor is "insight into the underlying concerns". By looking at a problem rather superficially, a party may completely miss the more important purpose or agenda of the bargaining session. By looking deeper into the issues,

more alternatives tend to be identified, which in turn facilitates the search for an integrative settlement. The last dimension, and perhaps the lesser of the three, is size. During negotiations involving large numbers of people, instances, events, abstract principles, or precedent-setting decisions, issues are often perceived as being larger than they really are. Large issues seem to make integrative outcomes impossible, and thus tend to arouse higher levels of perceived threat and defensiveness.

D. ECONOMIC RATIONALITY

Using economic notions of rationality, a party is assumed to select a course of action that will achieve the greatest expected value. This expected value is presumed to be a function of the desirability (utility) of a given settlement, along with the likelihood (expectancy) that the party could achieve that settlement.

According to Pruitt (1983), and Pruitt & Rubin, (1986), a party's choice of strategy is derived from the utility it assigns to satisfying both its own and the other party's concerns. Thus, collaborative or "win-win" strategies are more likely to be chosen when a party places a high utility on satisfying both its own and other's concerns. Pruitt has identified four considerations in determining the strength of a party's desire (utility) to satisfy his/her own concern: 1) the importance of the need which is at stake, 2) importance of

other issues competing for the party's attention, 3) the party's fear of conflict, and 4) the extent to which the party feels they represent the interests of its constituents (accountability). There are two factors identified when determining the strength of the party's desire (utility) for satisfying the other party's concern: 1) interpersonal bonds between parties, and 2) forms of dependence on the other party.

A party's expectation of success is the party's subjective probability that he/she could attain a given outcome - the degree of confidence that the outcome is attainable. Pruitt (1983) calls this expectation the "feasibility" of that alternative. Under conditions of economic rationality, then, a given outcome (collaborative or competitive) is assumed to be chosen as a function of both its utility and its feasibility.

E. NEGOTIATION PERFORMANCE

Conflict researchers have identified a set of criteria for evaluating the performance of the negotiation system or environment. Thomas (1992), developed a set of criteria for desirable outcomes of conflict episodes which builds upon an earlier work by Sheppard (1984). These criteria consist of: 1) resource consumption during episode, 2) decision quality, 3) perceived fairness, 4) satisfaction of the parties, and 5) effects upon working relationships.

Thomas also asserted that successful collaboration (integrative bargaining) tends to produce superior outcomes on these criteria. In an integrative outcome, fairness or justice (Eiseman, 1978) is enhanced since "all parties are vindicated." With regard to decision quality, it is often defined in terms of finding the most jointly optimal settlement. In terms of resource consumption it is argued that collaboration will take more time than other methods because of the time spent digging into deeper underlying issues. However, the time saved by getting a solid agreed-to settlement in one bargaining session and not having to deal with the issue again and again makes it relatively efficient for decision making (Follett, 1941). Increased satisfaction is not surprising, since collaboration tries to satisfy all the parties' concerns in a supportive environment. Lastly, collaboration enhances working relationships in that it tends to generate trust (Fisher & Ury, 1981), and seems linked to both increased liking and respect for the other party (Ruble & Thomas, 1976).

F. MEDIATION

Despite the obvious benefits of integrative negotiations there may be times when collaboration does not seem feasible. There may be insufficient time, the conflict issue may not allow integrative solutions, the parties may not have sufficient skills, or the necessary trust and motivation may

not exist (Thomas, 1992). Some of these deficiencies can be addressed through third-party intervention.

In general, mediation works best in conflicts that deal with negotiable, substantial issues, and are not emotionally escalated or deadlocked. The introduction of a mediator usually addresses the issues of mistrust, lack of skills, and/or motivation. Lack of time and the nature of the issues usually cannot be corrected or enhanced by the introduction of a mediator.

III. NEGOTIATION SUPPORT SYSTEMS

A. BACKGROUND

Due in part to recent advances in computer technology and the refinement of group decision support systems (GDSS), NSS has enjoyed increased attention as a tool providing the possibility of assisting group decision making activities in cooperative as well as conflicting settings. These interactive, computer-based tools are intended to aid negotiating parties in reaching an agreement by combining the best features of face-to-face meetings, with the computers considerable ability to collect, organize, process, and distribute information in textual or graphical form. Lim and Benbasat (1991), proposed that the effects of a NSS are brought about by two components: 1) the electronic communication channel and 2) the DSS itself.

B. CHANNEL

The utilization of NSS in a bargaining session introduces an addition channel available to the parties involved. This additional channel is not a substitute for the original face-to-face means of communication but a parallel and concurrent path for information transfer. According to Lim and Benbasat (1991), the computer, while serving as a communication medium, presents the user with two sets of characteristics: first, the

channel characteristics, which refer to the computer's capability of conveying information in different modes; and second, the user interface characteristics of the specific NSS.

1. Channel Characteristics

Different modes of communication are commonly classified according to the degree of social presence conveyed. Face-to-face communication usually permits the highest degree of social presence because it provides not just spoken communication, but paralinguistic cues (e.g. rate of speech, loudness, tone, etc.); kinesic cues (e.g. gestures, direction of gaze, etc.); and proxemic cues (e.g. distance, social power related to seating arrangements, etc.) (Ruben, 1988).

At the other end of the social presence spectrum are the textual and graphical/symbolic modes. It is these modes that the NSS utilizes as its channel. Due to the differences in delivery speed between spoken and written/typed communication, NSS is expected to influence the social dynamics of the bargaining session depending on both the social pressure and degree of spontaneity deemed appropriate. In addition, electronic textual communication affords the possibility of anonymity within a party, message formatting, as well as an equalizing iterative dialogue structure between the parties.

2. User Interface

In addressing the function of the user interface, attention has been directed to how closely the interface mimics human interpersonal communication, substitutes for it, or augments capabilities that humans do not possess. In addition, due to the large selection of media available, the impact of media selection, the burden on the user, and the timing of media introduction cannot be ignored (Lim & Benbasat, 1991).

Ease of use is an especially important factor when considering the introduction of computer-based tools. The interface ideally will have no detrimental effect on the negotiations and the parties using it, and in fact may augment communication. To reduce potential distraction between the parties, it is recommended that information requests and displays be prominent and clear, and their use should be relatively intuitive or easy for the parties to learn.

C. DECISION SUPPORT SYSTEMS FOR NEGOTIATION

Decision support software available for NSS include integrated modeling capabilities (such as risk analysis), decision trees, multi-attribute functions and other forecasting methods. Also available are structured group processes such as electronic brain storming, and Nominal Group and Delphi techniques (Jelassi & Foroughi, 1989). Using the structure and processing capabilities of the computer has been

shown to help enable parties to define and prioritize issues, generate alternatives, and to assist in evaluating conflicting solutions, often reducing the effects of distracting and compromising psychological and sociological factors present. The presence of emotional and normative conflicts among negotiating parties, and the need to control or monitor their impact provides much of the impetus for the development of this thesis.

IV. CONFLICT AND SOCIO-EMOTIONAL FACTORS

A. A THEORETICAL DISCUSSION

Because of the strong influence of economics in the conflict/negotiation literature, prevailing assumptions have tended to be rational/instrumental in nature. Parties have been assumed to choose behaviors based on their perceived likelihood of attaining desired outcomes. While these assumptions tend to be accurate, there are several factors that are omitted in this process model. First, strict economic rationalization does not take into account social/normative issues present in the negotiation environment. Thus, in an explanation of behavior, there is a tendency to ignore the extent to which individuals consider the normative acceptability (morality, ethicality) of the means chosen to achieve a given end. Second, economic assumptions tend to "sanitize" the conflict process by eliminating emotions and their potentially strong effects upon thoughts and emotions (Thomas, 1992). Incorporating the additive cognitive effects of two forms of reasoning - rational/instrumental reasoning and normative reasoning, with the influence of emotions, presents a closer approximation of the dynamics taking place during the negotiation process.

As a part of the often ignored impact of normative reasoning and emotions on the negotiation scenario, negotiators' perceptions, of whether trust or domination is a driving motivator, tend to direct the course of negotiations down separate and mutually incompatible paths. These perceptions tend to arouse different emotions and different notions of what is normatively appropriate. Pruitt and Rubin, (1986); and Sheffield, (1991), stated that mutual trust is a necessary condition for parties to share information, which leads to high joint outcomes, while domination is a form of withholding information and often results in low joint outcomes. This frequently results from a systematic intuitive bias that distorts a negotiator's behavior. By assuming that their interests are in direct conflict with each other, parties make certain assumptions that limit creativity and problem solving and diminish the probability of an integrative outcome (Bazerman, 1983). This bias introduces a tendency to underestimate the possibility of integrative outcomes, and to overestimate the conflict of interest between parties. Recognizing this bias and working to alleviate it should allow parties to be directed away from perhaps their intuitive distributive bargaining orientation so more solutions of higher joint outcomes can be generated.

B. SPECIFIC CAUSAL DYNAMICS OF NSS

Figure 4 presents a general model of the negotiation process and the role played by the NSS which incorporates Thomas' (1992) model of the events in a conflict process. For simplicity's sake, the model is based on the assumption that a single individual represents each of the negotiating parties, that he/she is acting autonomously, and both have complete authority and bear complete responsibility for their actions and outcomes. Additionally, the problem(s) and issues at conflict are assumed to be non-trivial, in that multiple issues are at stake. As complex situations are more likely to tax the capabilities of the parties involved, inherent limitations, in the negotiation process and individuals involved, can become accentuated, and thus more likely to be recognized.

The process begins with the party's awareness of the conflict and is experienced in terms of the corresponding *thoughts and emotions* concerning the situation and possible responses to it. The thoughts and emotions result in the formulation of *intentions* which, when structured by the processing capabilities of the NSS, result in the party's *behavior*. The other party then has thoughts and emotions concerning the situation, which are in turn translated to intentions and behaviors via the NSS, and from this comes an *outcome* which is evaluated by the parties. This process is

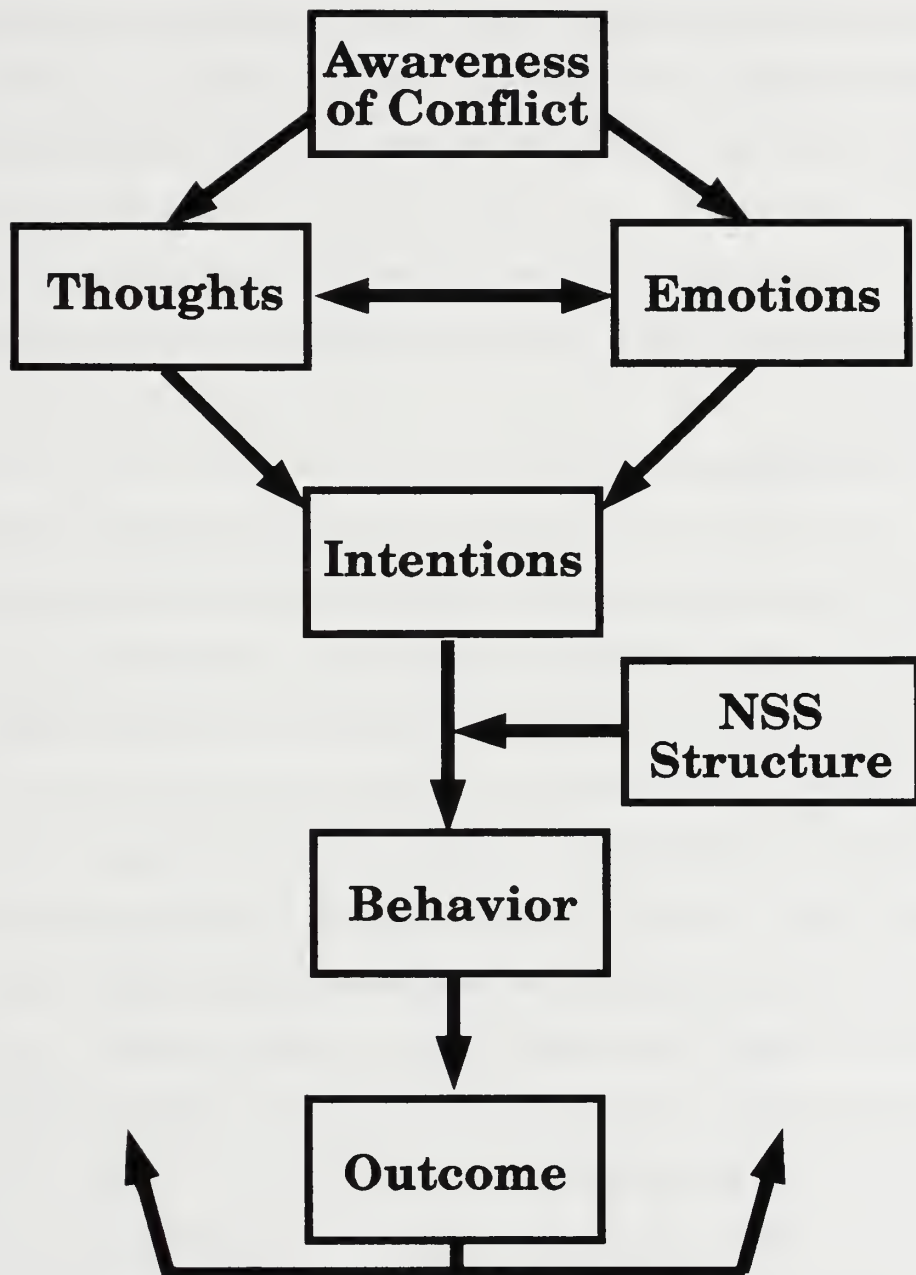


Figure 4 : Basic model of negotiation incorporating NSS

repeated until both parties accept the outcome or break off from negotiations (Thomas, 1992, p 16).

A party's thoughts and emotions are particularly important in the negotiation process. They heavily influence the party's subjective perceptions which in turn help determine a party's intentions. As such, these factors are often the target of influence attempts during the negotiation process by the other party, and it is this area this thesis chooses to focus on.

1. Awareness

Going back to the original definition of conflict, the episode begins when one party becomes aware that another party has negatively or is about to negatively affect something that he/she cares about. Here the party may become aware of at least one of three basic types of conflicts: 1) goal conflicts, 2) judgement conflicts, and 3) normative conflicts (Thomas, 1992, p. 18). In the types of negotiations treated in this thesis, the central issues involve goal conflicts. The other types of conflict, if they arise, introduce peripheral issues which distract from the central issues.

a. Goal Conflicts

Goal conflicts are a development of parties seeking divergent or apparently incompatible outcomes. This type of conflict is a driving force in adopting a distributive bargaining orientation, in that seeking attainment of one's

own goals is done, if necessary, at the expense of the other party's attainment of theirs. While some goal conflict is inevitable at the beginning of negotiations, ideally parties can identify and generate suitable alternatives so as not to block attainment for the other party while still satisfying their own agenda.

Entering a bargaining session with the perception of incompatible goals often introduces a distributive bias. This bias has been shown to generate more hostility and mistrust between parties and diminishes the number of suitable solutions generated (Bazerman, 1983).

b. Judgement Conflicts

Judgement conflicts differ from goal conflicts in that, while two parties may share the same goal, they disagree over the best way of achieving it. The differences come from different interpretations of the same factual information. Both parties believe that the other has come to an incorrect conclusion regarding that information (Thomas, 1992, p. 18).

One of the possible assumptions made in building one's belief that the other is in error, is that one party believes they have information the other does not have. A variation of that theme is that one party feels the other is using improper reasoning in arriving at their conclusion and that they do not understand the "true" problem or issues at stake. Many of these biases are based, in part, on poor or no

communication between parties, and thus some degree of ignorance may be present in evaluating the other party's knowledge background.

c. Normative Conflicts

Normative conflicts are manifested in a party's assessment and expectations on how the other party should behave. Problems develop when one party appears to violate the standards of the other and feelings of disapproval, blame, anger, and hostility may be felt by the party who felt wronged. This can escalate into sanctions to enforce conformity or to punish the other party, easily resulting in sub-optimal agreements or deadlock (Thomas & Pondy, 1977).

Normative criteria applied to conflict management involve the feelings of fairness and justice both as applied to distributive justice (the fairness of the ultimate settlement) and to procedural justice (the fairness of the procedure for arriving at the settlement) (Thomas, 1992). Perceptions of distributive justice are made up of several criteria, such as: 1) equitability, 2) consistency of results with similar conflicts, 3) the relative needs of the parties, and 4) consistency with accepted rules and norms. The perception that these criteria are satisfactory or fit within the party's allowable norms leads a party to view the outcome as acceptable.

Normative procedural justice as identified by Sheppard, (1984) and Thomas, (1992) involves: 1) the neutrality of the third party, 2) the ability of the principle parties to control the process, and 3) protection of the rights of the principal parties. In this, a party's perception of how they and the other party are being treated during negotiations shapes reaction during the episode as well as affects party acceptance of a potential settlement.

2. Thoughts and Emotions

A negotiator's perceptions and cognitive/emotional state are shaped as a party becomes aware of a given conflict. Thoughts, which help the party to sort out the conflict and consider ways of dealing with it, and emotions, which interact with thoughts, are molded to some extent during negotiations by impressions of how the episode is developing and the need to react to it. These values, even if not recognized in a conscious internal appraisal, will affect the process, and likely the outcome of any negotiation scenario.

As parties come together, each brings to the bargaining table their own definition of the conflict issue(s). This "framing" (Sheppard, Lewicki & Milton, 1986) of issues involves some interpretation or labeling of the primary concerns of the two parties, which in turn, usually suggests a set of possible settlements. With this set of possible settlements, comes some perception of the degree to

which each settlement will satisfy the concerns of both parties. This process has a tendency to focus or freeze parties on these initial settlements, thus limiting the further search for more integrative outcomes.

Size of the issue also has an impact on integrative orientations. Issues appear larger when they are seen to involve large numbers of people, instances, events, abstract principles, or as trend setting precedents for future interactions (Fisher, 1964). Motivationally, very large issues appear to make integrative outcomes impossible, to raise stakes dramatically, and also to raise levels of threat and defensiveness (Thomas, 1992).

Another key aspect of thought involves the expectancies of integrative or distributive outcome which are brought into the conflict episode. These expectancies often have a self fulfilling aspect that should not be ignored. One approach to gaining an integrative orientation is to show that integrative solutions do exist where none were thought to be. This also involves an element of trust in showing that the party can be trusted in engaging in this process. The act of eliciting and defining negotiation problems and issues between parties often helps them recognize these integrative solutions (Anson & Jelassi, 1990).

Conflict situations are usually accompanied by strong emotions. Many are generated during the conflict process (Kumar, 1989), while others, residual from other events,

affect the "mood" of the current episode. Kumar (1989) has noted that emotions have two types of influences that are relevant here: 1) their shaping of cognition, and 2) their additional motivational force. Regarding cognition shaping, Kumar notes that negative emotions, once aroused, feed back upon cognition to produce cognitive simplification, reduced trust, and negative interpretations of the other party's behavior. These things, especially cognitive simplification, seem likely to produce either/or conceptualization of conflict issues, and in general reduce a party's ability to think in an integrative fashion (Pruitt & Rubin, 1986; Thomas, 1992).

The source of emotional influences introduced to the proceedings are often difficult to isolate; however, their effects are more easily seen. Anson and Jelassi, (1990) in a summary of Kessler, (1978), and others, identified some of these characteristics to include:

- Poor working relationship, demonstrated by intense mutual distrust and little positive foundation in the relationship
- intense emotional involvement in the issues
- issues are abstract and intangible rather than specific
- unconscious or pre-conscious issues underlie the presented problem

Emotions also appear to impart additional motivational forces to a party's rational and normative reasoning. In extremes, these emotions can exclude or greatly simplify this

reasoning to the point that behavior becomes primarily an outlet for emotional venting. Anger and hostility, a byproduct of frustration, appear to motivate parties to behave aggressively (Baron, 1977; Kumar, 1989; Pruitt & Rubin, 1986, Chap 6; Thomas, 1992) and to attempt to thwart the other party in win/lose fashion. Anxiety and threat appear, on the other hand, to motivate a party to withdraw into a lose/lose position (Kumar, 1989).

Constructive feedback has been shown to arouse less negative emotion (Baron, 1988). By keeping feedback specific, considerate, and by not attributing poor performance to internal causes in the other party, one may promote a less angry and tense response from them. Baron has shown that people receiving constructive feedback reported they were more likely to respond toward a party with a collaborative or compromising orientation in the future.

3. Intentions

According to Thomas (1992), the combination of motivational forces such as rational/economic thinking, normative thinking, and emotions, result in a party's intentions. A party's intentions are a decision, based on these thoughts and emotions, to behave in a certain way, and affect a party's bargaining orientation. These conflict-handling orientations at the strategic level are classified and plotted along two basic dimensions of intent:

assertiveness, the extent to which a party tries to satisfy its own concerns; and *cooperativeness*, the extent to which a party tries to satisfy the other party's concerns. As mentioned earlier, five strategic intentions can be plotted along these two dimensions. These are: competing, accommodating, collaborating, compromising, and avoiding (Thomas, 1992). See Figure 2 and Figure 5. These bargaining styles affect the degree to which an integrative (win-win), distributive (win-lose), or in-between solution is pursued.

4. Behavior

Behavior is separate from intent in that behavior is the attempt to carry out one's intent. According to Thomas, (1992), there is always some degree of "slippage" between behavior and intention, in that behavior does not always convey or implement one's intentions. In other words, behavior is the observable actions or statements made by a party. A problem that can exist due to this separation of intent and behavior, is the unanticipated effect behavior can have of conveying the wrong intent through a party's miscalculations or unskilled enactment (Putman & Poole, 1987).

The Huthwaite research group, (Huthwaite, Inc., 1985) in an attempt to determine what characterized good negotiation patterns from bad ones, identified two behavioral tendencies. These were interpreted as: 1) aiding communications, and 2)



Figure 5: Conflict Handling Intentions
(Thomas, 1978)

building trust. Huthwaite's work as described by Thomas, (1992) included:

Less use of:

- Irritators (favorable statements about oneself, unfavorable statements about other)
- Immediate counter-proposals
- Defending/attacking comments
- Stating disagreement without first providing reasons
- Argument dilution (providing many reasons for each argument or case advanced, rather than the main reason or issue)

More use of:

- Advanced labeling of behaviors other than disagreement (letting the other party know what one is doing)
- Testing understanding and summarizing
- Asking questions
- Giving information on one's internal state (e.g., concerns, emotions, intentions)

Procedures designed to reduce the behavior that should be avoided, while promoting and enhancing the more desirable behavior, would in most cases be interpreted as a means of reducing the arousal of negative emotions in the other party, and providing elements of a supportive environment.

5. Outcome

The acceptance or disagreement with a proposed solution is decided upon by the separate parties based on both

rational-instrumental considerations, and normative judgements of whether the solution, and the process of arriving at the solution, were fair (Thomas, 1992).

Thomas described the different approaches to evaluating the rational-instrumental desirability of conflict outcomes based on how they satisfy the needs of the individual, the parties involved, and the system as a whole. "Partisan" approaches are identified with satisfying the needs of just one of the parties involved. Skills and resources are utilized to fulfill one's own concerns and protect the party from the other. "Joint-welfare" approaches are directed at satisfying the goals and concerns of both parties. Raiffa (1982) and Boulding (1963) equated the goodness or quality of the settlement with its pareto-optimality. This has also been described as "win-win" (Filley, 1975) and "integrative" (Thomas, 1976) outcomes. "Systemic" approaches are concerned not just with the joint welfare of the parties but also with the consequences of the conflict for the larger system.

Normative satisfaction with the outcome has been broken into both distributive and procedural justice. Eiseman (1978, p. 136) stated that collaboration ("integration") enhances both parties' sense of justice since "all parties are vindicated." Normative approval of collaboration is also indicated since collaboration is rated as the most socially desirable of the strategic intents (Thomas & Kilmann, 1975). Additionally, collaboration and

decision quality have been linked because decision quality has often been defined in terms of finding the most jointly optimal solution (Thomas, 1992). Lastly, the exchange of information, and the exploration of deeper underlying issues presumably produce greater learning for both parties, which translates to improved decision making on other similar tasks.

V. REQUIREMENTS AND EXPECTATIONS FOR NSS

A. FUNCTIONAL REQUIREMENTS OF NSS

1. System Configuration

Lim and Benbasat (1991) identified and summarized many of the components and functionalities of a computer-supported negotiation aid. The two major components are: a decision support system (DSS), and the electronic linkage, or channel, between parties. In their work they have reasonably established both the usefulness and feasibility of both the DSS, as significantly aiding decision making, and electronic communications, as an alternative or supplementary channel.

2. Functionalities

To provide support to negotiating parties there are several basic functions NSSs commonly perform and many more, that if incorporated, could affect the integrative orientation of the negotiation environment. Some of the basic functions provided by NSS are:

- Support for requirements analysis - help parties determine what they need or should ask for.
- Support strategic analysis - help determine what the other party needs and try to correlate a compatible position with highest joint outcome.
- Support the interaction - provide a communication channel for the passing of common referents.

Some of the inherent capabilities that exist, or additional features that might be desirable in facilitating an integrative bargaining environment are:

- Track time - allocate equal slices of time for each party to utilize.
- Prominent display of issues being discussed along with current positions of parties.
- Limit or restrict non-task related communication.
- Provide feedback - show parties a history of their past and present positions and compare positions to pareto-optimal solution.

Referring back to Huthwaite's (1985) summary of behaviors to be avoided and behaviors to be encouraged to achieve high outcome solutions, this thesis proposes that use of NSS, with some of the features mentioned above, can specifically reduce many of the occurrences that should be avoided or minimized, while promoting and enhancing the more desirable actions. The use of NSS is expected to be of some assistance in the generation, evaluation, choice and communication of offers in clear and non-provocatory terms.

B. EXPECTED IMPACTS OF NSS ON NEGOTIATIONS

Use of NSS is expected to influence the dynamics of negotiation by creating an atmosphere that emphasizes order, rationality, equality and empathy with the other party's position. This proposed impact goes beyond the prescriptive description of NSS's analytical processing capabilities (Lim

& Benbasat, 1991), and affects the normative and social/emotional tone of the interaction.

Normative and socio-emotional biases, while not completely eliminated, may be controlled and limited to a degree. The primary purpose of a NSS as a group support system is to reduce discordance and seek consensus (Bui, 1991). The negotiator's NSS is supposed to help the users by structuring the session to better refine the party's objectives and tactfully convey them to the other party. In addition, by appreciating better the strengths and weaknesses of the other party's position and arguments, interest differentials may be identified more quickly and thus negotiations may move towards a more integrative solution (Bui, 1991). Some of the expected benefits imposed by the structure of the NSS are:

- Identify controversy, and clarify and prioritize issues/criteria
- Think across issues (examine issues from various perspectives)
- Manage number and size (keeps issues from growing larger than they really are)
- Equalize parties (both parties have fair and equal access and control)
- Separate people and emotions from problem (objectify issues and make them tangible)
- Manage communication (control the flow and content of communication)
- Maintain momentum and tempo
- Track bargaining trends (provide feedback to parties on own and other's performance and behavior)

1. Impact on Awareness

As mentioned earlier, NSS is intended to help the parties focus on key goal conflicts and to reduce the introduction of peripheral or distracting issues.

a. Impact on Goal Conflicts

If parties are forced to formally define their agendas and issues in concrete objective terms, a focus will be brought to bear on the truly important issues. The limitation, or addition of expressing their concerns in writing on the computer is expected to encourage the parties to be explicit and accurate, and removes some of the emotionally charged atmosphere that often surrounds conflicts. By removing some of the opportunities that promote argument dilution, parties are discouraged from bringing in irrelevant and provocative agendas which are often related to personalities rather than specific subject matter (Kessler, 1978; Anson & Jelassi, 1990; Thomas, 1992).

NSS, as a vehicle for identifying and clarifying problem and issue/criteria statements, is anticipated to provide a common medium for critique, feedback and response. This echoing and feedback, in the form of paraphrasing and common displays, helps assure both parties that they are both being heard, and are dealing only with the concrete issues to which the parties previously agreed. They can therefore concentrate on these mutually identified and understood

criteria and concern themselves less with defense against distributive tactics and/or hidden agendas. The combination of being on a less defensive footing and developing a deeper understanding of the other party's concerns as well as one's own, appears to increase the desirability of an integrative outcome, and to make the other's behavior seem more reasonable (Eiseman, 1978; Filley, 1975; Fisher & Ury, 1981; Follett, 1941; Pruitt & Rubin, 1986; Thomas, 1992; Walton, 1969).

Additionally, as a written record of the state of negotiation, NSS may be used to track progress, or lack thereof, so both parties can assess their next move. This history of positions taken could also be used to recognize if parties have reverted to an earlier unproductive position and thus help prevent a circular set of arguments. Similarly, NSS may help reestablish productive negotiations at a previous mutually agreeable state, if pursuit of agreement becomes deadlocked.

b. Impact on Judgement Conflicts

NSS may have some effect in helping reduce the impact of judgement conflict. The NSS is expected to facilitate this by forcing parties to separate the problem or goal statement(s) from the issues and criteria surrounding the problem. Finding agreement on the mix of criteria, which is essential, can frequently be obscured by the introduction of seemingly relevant judgement concerns that: 1) while

important, should have been resolved earlier, or 2) are irrelevant, and are used to confuse or dilute bargaining positions. The "goal statements" are the entire objective of the negotiation session while the criteria are specific attainment objectives that, if resolved, will solve the problem. By combining the different relevant information, insights, or reasonings of the two parties, more jointly accurate conclusions may be drawn as to what is the true problem, and what are the real issues. For example, a company has noticed a drop in sales, and the production and marketing departments are trying to reach a solution. The deeper shared problem or goal is how can the company create more revenue. The judgement conflict is that marketing thinks it is a production problem, and production thinks it is a marketing problem. Due to their different reasonings, perspectives and concerns, they reach different conclusions which ultimately will shape the form of the solution they are considering.

NSS in this example, by keeping discussion only on accepted concrete terms, may help restrict introduction of intangible concerns (which in this case should be resolved separately) from finding their way into discussions and arguments. This would likely affect negotiations later, in that parties must concentrate on concrete issues that fit into an acceptable package to meet the other's criteria.

c. Impact on Normative Conflicts

NSS is expected to have several beneficial impacts on normative influences present in negotiations. As presented earlier, perceptions of distributive justice (fairness of the settlement) are made up of several criteria, such as: 1) equitability, 2) consistency of results with similar conflicts, 3) the relative needs of the parties, and 4) consistency with accepted rules and norms. The perception that these criteria are satisfactory or fit within the party's allowable norms leads a party to view the outcome as acceptable.

Normative procedural justice (fairness of the process) additionally was identified as involving: 1) the neutrality of the third party, 2) the ability of the principle parties to control the process, and 3) protection of the rights of the principal parties. In this, a party's perception of how they and the other party are being treated during negotiations shapes reaction during the episode as well as affects party acceptance of a potential settlement.

With regard to distributive normative justice, first, NSS is expected to enhance feelings of equitability in that shared NSSs are designed to be completely impartial and unbiased. The perception that an impartial NSS has controlled some aspect of the interchange between parties may help promote feelings that each party got a fair and equal settlement. Second, consistency of results with similar

conflicts is also very likely assuming the same modelling algorithm is utilized. Due to its mechanistic processing, the NSS should, with the similar sets of data, generate similar proposed solution sets for evaluation. The robustness and suitability of the algorithm to the nature and values of the criteria may provide opportunities for differences to develop, but this likely reflects differences and lack of similarity between conflicts. Third, the relative needs of the parties presents some difficulties which may be partly addressed through NSS and party intervention. The NSS cannot inherently recognize the relative needs of the parties, but the participating parties may. Thus if one party is perceived to have an unfair disadvantage, and in fairness requires certain unilateral concessions from a "willing" opposing party to equalize their positions, the one-sided concession can be represented by a "handicapped" utility or value of that concession by the "willing" party. The NSS does not provide this automatic compensation. Nevertheless, the act of granting a unilateral concession by a party via the NSS will be openly communicated and should be easily recognizable by the other. This in turn can generate feelings of trust and gratitude and thus promote integrative orientations. This concession giving is part of the sequence of offer-counter-offer also affects normative procedural justice. Lastly, consistency with rules and norms is expected to be enhanced, as the NSS has provided a formal channel and medium for

exchange and has helped enforce party adherence to format and criteria under discussion.

NSS may affect perceptions of normative procedural justice just as it affects perceptions of distributive justice on the outcome. NSS is inherently unbiased in its treatment towards the parties. Both parties in general, should be equally affected by the strengths and limitations inherent in the system. Strict adherence to the format and medium is expected by the application of the NSS. First, the effect of neutrality of a third party (the NSS) on the process may help reinforce party feelings that they are being treated equitably. Second, parties still have mutual control over the negotiation process because NSS, as a tool and a supplementary interface between parties, is, in this setting, equally accessible by both. Face-to-face dialogue, for this thesis, is assumed to be unrestricted. Ultimate decision to accept/reject generated alternative rests with the parties, which reinforces the notion that the parties have not relinquished control. Lastly, both parties need to feel that during the negotiations their rights will remain protected and that they can proceed with reduced feelings of distrust and defensiveness. The NSS as a timekeeper is anticipated to do this partly by enforcing an equal floor for both parties to express themselves. The recognized impartiality of the clock helps keep parties focused on the issues lest they lose their opportunity to voice their true concerns. Feeling are not as

likely to be jeopardized because much of the time allotted to dialogue is perceived to be under the control of the NSS and not the other party. NSS, for this and similar arguments presented earlier, is expected to help reassure parties that their interests are being protected through the formal channel and strict format provided via the system.

2. Impact on Thoughts and Emotions

As mentioned earlier, when parties come together, each brings to the bargaining table their own definition of the conflict issue(s), interpretations, and possible solutions or settlements. This process has a tendency to focus or freeze parties on these initial settlements, thus limiting the further search for more integrative outcomes.

One possibility of thwarting this fixation on the immediately suggested solution set, would be to provide a means to force parties to examine issues not as predetermined either/or decisions but recognize that integrative outcomes do exist (Bazerman, 1986). NSS, it is proposed, through its additional textual common channel encourages parties to define their concerns concretely and in a way that stands up to critique. This in turn promotes discussion, which encourages both parties to explore deeper understanding of the problems and issues before them. Directing a party away from taking a strict "egocentric" (Thomas, 1976) position allows parties to explore these deeper insights into the issues. This

appreciation of underlying concerns encourages collaborative problem-solving (Eiseman, 1978; Filley, 1975).

Size of the issue also has an impact on perceptions and integrative orientations. Motivationally, very large issues appear to make integrative outcomes impossible, to raise stakes dramatically, and also to raise high levels of threat and defensiveness (Thomas, 1992).

NSS is expected, as a shared tool with processing power generally superior to human capabilities, to help control the manipulation and organization of large and numerous issues, thus managing the scope to more human proportions and discouraging a distributive orientation.

Conflict situations are usually accompanied by strong emotions. Many are generated during the negotiation process (Kumar, 1989), while others, residual from other events, affect the "mood" of the current episode.

NSS, with its restricted communication channel, and by encouraging equal objective dialogue, may reduce the development and ultimate conveyance of feelings of anxiety and threat as well as help prevent the escalation of provocative feelings.

There are a number of tactics, which may be facilitated by use of NSS, that recognize and use the influence and restriction of emotions to pursue an integrative strategy (Thomas, 1992). The first is to avoid any unnecessary angering of the other party toward oneself which

might intensify the other's win-lose intentions. NSS, while not able to completely prevent escalation, is expected to help provide a stable, non-provocatory environment in which to discuss and explore problems, issues, and options. By utilizing a communication format that limits personal, non-task related comments from being passed, focus is turned to the tangible issues defined during pre-negotiations. NSSs that do include an open dialogue window to convey personal thoughts may introduce the opportunity to convey non-task related and possible provocative communication. However, most social and emotional communication is passed through paralinguistic, proxemic and kinesic cues (Ruben, 1988) which can be screened out if the NSS acts as the only form of communication.

A second tactic used to develop an integrative outcome would be to facilitate the communication of positive emotions. This is done not only to interfere with possible anger from the other party but also to put the other party in a more generous mood. In general, NSSs do not appear particularly suited toward this type of support due to the very emotion-inhibiting structure that gives it its stability. However, by supporting normative distributive and procedural justice, feelings of equitability, fairness, satisfaction and generosity are expected to be enhanced.

3. Impact on Intentions

As previously discussed, the combination of motivational forces such as rational/economic thinking, normative thinking, and emotions result in a party's intentions, which, at the strategic level are classified and plotted along two basic dimensions of intent: *assertiveness*, the extent a party goes to satisfy its own concerns; and *cooperativeness*, the extent a party takes to satisfy the other party's concerns.

The introduction of NSS is expected to have an impact by overcoming a distributive orientation if it is present. The goal is to get the parties to pursue a collaborative (cooperative, assertive) and integrative intention. It is in this way that both parties attempt to fully satisfy their joint concerns. NSS is believed to facilitate this integrating, or bringing together of the two parties, in order to confront (work through) the conflict. By providing a formal structured medium in which to convey their concerns, NSS may initiate dialogue where none was present before. Poor or no communication directed at the primary issues is the gap NSS is expected to fill.

4. Impact on Behavior

Because behavior is separate from intent, there is always some degree of "slippage" between the two, in that behavior does not always convey or implement one's intentions.

Due to its structure and formality, NSS is expected to reduce the amount of "slippage" between intentions formed earlier in the negotiation session, and the behavior intended to carry out that intent. This in effect, reduces the unanticipated effect behavior can have of conveying the wrong intent through a party's miscalculations or unskilled enactment. The more predictable environment for both parties is expected to save time and enhance feelings of control.

5. Impact on Outcome

NSS is expected to have several impacts on negotiation outcome based on both rational-instrumental considerations, and normative/emotional judgements of whether the solution, and the process of arriving at the solution, were fair. Some of the evaluation criteria used during outcome evaluation include:

- Resource consumption (primarily how much time is expended in reaching a settlement)
- Decision quality (is the solution acceptable both in economic and normative quality)
- Perceived fairness (is settlement and procedure used fair to both parties)
- Satisfaction (does agreement satisfy parties economically and normatively)
- Working relationship (what impact will the negotiation episode have on future relationships)

These are the specific areas where it is expected that the use of NSS can aid negotiators. Should agreement be

reached, the negotiations are over. With no agreement, another set of thoughts and emotions are generated, and an iterative cycle develops with the formulation of intentions and modified bargaining positions, which, when processed and filtered by the NSS and evaluated by the parties, will be demonstrated through behavior, and result in either accepting or rejecting a newly generated solution. The cycle continues until acceptance is reached or one of the parties breaks off from negotiation.

VI. A PROPOSED RESEARCH DESIGN

A. PROPOSED METHOD

An objective of the evaluation of the concepts proposed in this thesis, would be to formally test the impact NSSs have on the criteria for evaluating the outcomes of the negotiation. These criteria: 1) resource consumption, 2) decision quality, 3) perceived fairness, 4) satisfaction of the parties, and 5) effects upon working relationships; all impact a party's acceptance of a generated solution or willingness to use the NSS in subsequent negotiations.

B. HYPOTHESIS DEVELOPMENT

1. Resource Consumption

Hypothesis: *Resource consumption (time) will be lower for parties utilizing NSS than for those that are not.*

One of the first expected effects of the use of NSS is that resource consumption (time) used in achieving a solid, long lasting agreement will be less for parties utilizing NSS than for those that do not. The emphasis of this statement is on the long term time savings because negotiating a quality settlement, while perhaps initially more time consuming, is expected to save time ultimately in that the same conflict does not resurface again only to be re-negotiated over and over.

2. Decision Quality

Hypothesis: *Decision quality will be greater for parties utilizing NSS than for those that are not.*

Decision quality is another area that NSS is hypothesized to impact. Quality here will be defined in terms of the amount of utility of the decision for the two parties. By utilizing a system of rankings for the issues under discussion along with the values for these issues, outcomes can be evaluated objectively by the utility they provide. NSS provides both the generation and presentation of joint and individual utility that allows the results to be easily interpreted and thus a rational economic judgement can be made.

3. Fairness

Hypothesis: *Perceived fairness of the negotiation process and of the outcome will be higher for parties utilizing NSS than for those that are not.*

Fairness has two interpretations, fairness of the process and fairness of the outcome. Both are subjective perceptions based on how a party feels they are, or were treated as compared to the other party or some ideal, and how "just" they feel the outcome was. NSS is expected to increase a party's perception that they are being treated fairly (procedural), and that the settlement is fair (distributive)

by being consistent, being equitable, aiding communications, and building trust. Because perceptions of fair outcomes are established not just at the conclusion, but during the process of negotiations, NSS's affect on procedural fairness is expected to also ultimately impact perceptions of distributive fairness.

4. Satisfaction

Hypothesis: *Satisfaction with the outcome will be greater for parties utilizing NSS than for those that are not.*

Because satisfaction is often associated with decision quality there is rational economic justification for accepting a solution as satisfactory. NSS with its modeling and processing capabilities can generate the jointly optimal solutions needed to feel satisfied economically. Satisfaction is also felt toward the process, and normative perceptions of fairness, morality, ethicality, etc. all affect party procedural satisfaction. NSS is expected to impact this area just as it does for feelings of fairness. Because satisfaction with the outcome is established not just at the conclusion, but during the process of negotiations, NSS's affect on procedural satisfaction is anticipated to also ultimately impact satisfaction with the outcome.

5. Working Relationships

Hypothesis: *Working relationships will be better for parties utilizing NSS than for those that are not.*

A benefit of the collaborative environment that is expected to be generated by NSS is its effect on the quality of working relationships. Perceptions of collaboration in the other party are linked to feelings of both liking and respect (Ruble & Thomas, 1976) for that party, and collaboration is also believed to generate trust. The employment of NSS to communicate and share information is expected to help create the very type of open supportive environment upon which collaboration depends. This in turn should promote the conditions and environment that build long term working relationships.

Working relationships may not exist between parties other than for the negotiation session they are participating in. However, for some parties the ability to work productively together in the future depends on maintaining or building relationships that support, or at least do not hinder each other. Some parties come together with relationships already strained from past confrontations or events, or they may not recognize a need to be able to work together now or in the future. NSS is hypothesized to enhance working relations for parties who use it.

C. PROPOSED EXPERIMENTAL SETTING

The following experimental setting is only one of many possible formats that would be useful in evaluating the validity of these hypotheses. The procedures and premises are intended as a frame of reference or a starting point for future research. Additional development of the concepts and the research environment are both expected and encouraged.

This thesis proposes that post-questionnaires be utilized to capture the perceptions and feelings of negotiation participants. In order to provide a comparison of the effects of negotiations with NSS as opposed to negotiations without it, it is recommended that two groups of parties be employed. Using identical settings and equal number of participants, one group of negotiating individuals should proceed with the aid of a NSS, and the other group should proceed without a NSS, thus acting as a control and providing points of comparison for the study.

Stone's book on research methods in organizational behavior (1978) proposes several questionnaire formats. Two that appear appropriate are: listing a statement followed by asking the participant to indicate the extent that they agree/disagree, or asking a question with graduated responses. An example of the first would be: "In general, I'm satisfied with the negotiation settlement." Strongly Disagree - Moderately Disagree - Slightly Disagree - Slightly Agree - Moderately Agree - Strongly Agree, while an example of the

second type would be: "How often did the other party anger you?" Never - Rarely - Sometimes - Often - Always. Researchers have developed batteries of such questions trying to isolate psychological factors. Here are presented only a few to provide examples for further research.

D. PROPOSED MEASURES AND SAMPLE QUESTIONNAIRE

Before determining the impact NSS has on the negotiation process and outcomes it is necessary to identify exactly what measurements to consider. In the preceding discussions several constructs have been identified. These constructs: resource consumption (time), decision quality, perceived fairness, perceived satisfaction, and working relationships, are the basic outcomes of the process and settlement of negotiations. Utility, for decision quality, is directly calculable; however, time in the long term, fairness, satisfaction, and working relationships are not directly observable. Thus empirical referents (e.g. scores from questionnaire measures) of these constructs will have to be used in evaluating the validity of the assertions (Stone, 1978). Validity will have to be inferred from answers to various questions aimed at assessing these constructs.

Before assessing the constructs, some of the independent and dependent variables need to be identified. An independent variable is a variable which when varied is assumed to be the cause of change in another variable (i.e. dependent variable).

A dependent variable is the variable that varies as a consequence of changes in values of its assumed cause (i.e. independent variable). Not mentioned but present, an intervening variable is an unobservable process and/or state associated with a person or event, that helps explain linkages between an independent and dependent variable (Stone, 1978). For the proposed study the employment or not of the NSS would be an independent variable, and the outcomes would be the dependent variables. Intervening variables will not be measured.

1. Measuring Resource Consumption

Resource consumption (elapsed time) is the dependent variable that, while initially appearing easy to measure in an experimental setting, presents difficulties because the ultimate success of a negotiation session is often determined over a great length of time (does the settlement hold up over days, weeks, years). As expressed earlier, use of NSS is hypothesized to save time in the long run because a long lasting settlement can be reached based on deeper understanding and appreciation of underlying issues. Measuring time in a short term, experimental setting may demonstrate that NSS use actually increases time consumption because of the increased dialogue and in-depth discussions. Although short term time consumption can be measured in this study, it is not the primary focus, and measuring the

durability of an agreement over long periods of time presents logistic and control problems. However, there may be a few indicators that may predict the durability of the settlement. These are: commitment to the settlement (do people believe in the process and settlement), and perceptions as to the nature of the conflict (is it a conflict that will continue to surface routinely regardless of past settlements).

A sample of some questions that may indicate the durability of a long lasting settlement are provided below. These examples all utilize a graduated scale described earlier.

- I'm confident the settlement is a good one and will not need to be reopened. (Strongly Disagree to Strongly Agree)
- I'm concerned that underlying issues remain unaddressed. (Strongly Disagree to Strongly Agree)
- This conflict has always been around and will always be around. (Strongly Disagree to Strongly Agree)

2. Measuring Decision Quality

Decision quality, as the dependent variable, for this proposed experiment will be based on the utility derived for each party separately and jointly. These utilities are easily calculable from data obtained by the NSS from parties during negotiation. Pareto-optimality would be one satisfactory benchmark for determining the highest joint utility for the parties. These utility scores should be recorded for parties utilizing NSS and for those that are not, and a comparison

made to determine the impact NSS had. No questionnaire is suggested for this part.

3. Measuring Fairness

Normative judgements of fairness are based on distributive (fair outcome) and procedural (fair process) justice. The dependent variable is outcome fairness, however, procedural fairness will affect a parties perception that the outcome is "just" and so some questions in the questionnaire directed at measuring that may prove useful. A suggested focus for the questions would be: equitability, consistency, relative needs of the parties, adherence to rules/norms, third party neutrality, party control over the process, and protection of party rights. A few sample questionnaire entries for distributive fairness might be:

- The decision reached was fair for both of us. (Strongly Disagree to Strongly Agree)
- The decision we reached contained an equitable combination of gains and losses for both of us. (Strongly Disagree to Strongly Agree)

A sample of questions directed at procedural fairness might be:

- I felt that I was on an equal footing with the opposing party. (Strongly Disagree to Strongly Agree)
- I feel both parties were treated the same. (Strongly Disagree to Strongly Agree)
- I felt we had equal control of the process. (Never to Always)

- I felt my rights were preserved during the process.
(Strongly Disagree to Strongly Agree)

4. Measuring Satisfaction

Satisfaction with the outcome is often linked to decision quality, so data from the utility generated for the parties may be an indicator of satisfaction. Because satisfaction with the outcome is established not just at the conclusion, but during the process of negotiations, NSS's affect on procedural satisfaction will also ultimately impact satisfaction with the outcome. The dependent variable is satisfaction with the settlement. This is defined by how it meets at least the minimum acceptable needs (utility) of the party, and is supported by satisfaction with the process. Again, some suggested question topics that should indicate perceptions of satisfaction include: needs of the parties, equity, expectations, and behaviors. Some sample questions are:

- I achieved what I needed during negotiations. (Strongly Disagree to Strongly Agree)
- I am satisfied with the outcome of this negotiation. (Strongly Disagree to Strongly Agree)
- I feel this agreement came out better than I expected. (Strongly Disagree to Strongly Agree)

5. Measuring Working Relationships

Determining the quality of working relationships is largely based on the willingness of the parties to work

together in the future. Since that is a prediction, determining the basis of that intent will depend on the feelings held toward the opposing party and perceptions of how they were treated. The dependent variable, working relationship, may best be indicated by questions focused on perceptions of: trust, mutual respect, reliance on each other, and willingness to work together in the future. If parties are strangers or will never have a chance of working together, then the validity of some of these indicators may be questioned. Some sample questions are:

- I respect the other party. (Strongly Disagree to Strongly Agree)
- I trust the other party. (Strongly Disagree to Strongly Agree)
- I would look forward to working together in the future. (Strongly Disagree to Strongly Agree)

E. ILLUSTRATIVE CASE

To put this proposed research setting into perspective, it will be useful to provide an illustrative scenario to refer to. This hypothetical case is not original and is in fact a derivation of a case described by Bui (1992).

In the aftermath of the Desert Storm confrontation, world attention has been increasingly directed towards this politically volatile geographic region. Two major players potentially concerned with future developments and security in

the region are the U.S. and the hypothetical Confederate States of Arabia (C.S.A). Both parties feel, for sake of argument, that increased U.S. presence, perhaps on a non-temporary basis, would provide increased stability, and in periods of conflict, quicker and more appropriate response. To facilitate this, both are considering establishing U.S. leased base rights in a strategic region of C.S.A.

The negotiation involves six issues or criteria: 1) duration of the use of the military base by the U.S., 2) civil jurisdiction of C.S.A. over military personnel stationed there (whose laws will be enforced), 3) defense sovereignty (whose control are the forces under), 4) location of the base, 5) maximum peacetime size of force present at any one time, and 6) economic compensation. In a study, each party representing a country should be given a background briefing and instructions on what values and utilities are desired and acceptable.

Without developing any particular values, it can be seen that both parties will have a large number of combinations that may meet their demands, and among that solution set there will some combinations that will provide the highest joint utility. Provided an integrative environment can be established, finding that/those solution(s) will be the goal of the negotiators responsible for developing a suitable agreement. During negotiations it is proposed that parties will communicate offers and counter-offers both with the

specific values, and a comparative ranking or utility for each criteria. The shared NSS will act as the medium for the formal declaration of each party's positions.

This case is provided because it contains the necessary elements, structure, and scope for an experimental setting. First, the scenario contains a mix of both economic and emotional issues that should test the conditions outlined previously. The amount of money to be paid as an economic consideration may need to be weighed against the emotional issue of civil jurisdiction. Second, the number of issues/criteria are enough to tax the abilities of negotiators without overwhelming them (with or without NSS). Third, for the experimental setting, the positions of the parties are different but not so directly opposed that a mixed-motive bargaining session is impossible. Both want an agreement but both do not want to give up too much. Lastly, the scenario is real enough that participating subjects may be able to fit into their assigned role with some degree of commitment and conviction.

F. PROPOSED NSS TO BE USED FOR THE EXPERIMENT

The software envisioned for testing the hypotheses presented here is based on a formulation originally described in a publication on Group Decision Support Systems (Bui, 1987; Bui & Sivasankaran, 1991). The first character-based, menu-driven Bilateral NSS program based on this design was written

in the Pascal language in 1987 and subsequently translated to the C language and Visual Basic language in 1991 and 1992 respectively. The latest version, to be run on an IBM compatible PC, is the product of a thesis project at the Naval Post Graduate School (Sabene, 1992).

The Bilateral NSS is a multiple-attribute, joint utility negotiation model that supports a two party negotiation strategy. Negotiation sessions can contain up to ten issues of contention, and within an issue, each party can assign a relative utility that falls within the range of values defined by the party's initial offer. In addition, relative weightings can be assigned to each issue by the parties involved. Once party variables are entered for both parties, negotiation results are calculated and displayed in tabular and graphical formats (Sabene, 1992).

The purpose of the Bilateral NSS is to assist negotiators in achieving an equitable solution to a negotiation problem. Each session allows the user to enter issues and corresponding weights and utilities. After receiving inputs from both parties, the program calculates and displays results. This software supports "what-if" analysis to allow parties to vary their input variables and see the effects on the final results (Sabene, 1992).

There are several reasons for the selection of this software for the proposed test. First, the program is based on a well-proven economic model for negotiation and is based

on the concept of pareto optimality. This provides an objective indicator, based on utility, of individual and joint outcomes. It has the capability of handling up to ten issues and makes use of both the values and weights incorporated in these multiple criteria. Second, the user interface has been significantly updated to incorporate the latest graphical users interface (GUI) techniques and "windows" structure. This makes operation of the software easy and intuitive to learn, and relatively non-distracting during the negotiation session. Third, the output is in both tabular and graphical form. The clarity of the output coupled with the speed of most of today's PCs makes "what-if" querying a viable option. This helps promote integrative party experimentation with bargaining positions. The software is available for testing at this time.

VII. CONCLUDING REMARKS

The intent of this thesis was to examine the negotiation/conflict environment and examine some proposed effects that Negotiation Support Systems have on the socio-emotional climate. It also was intended to show the expected impact of NSS on negotiation outcomes and party perceptions. As proposed in this thesis, the introduction of NSS into the negotiation cycle could change the way in which bargaining parties interact. Normative and socio-emotional biases, while not completely eliminated, may be controlled and limited to a degree. This study suggests that use of a NSS as a group support system reduces discordance and supports consensus seeking. Use of the NSS during negotiation helps the users by structuring the session to better refine the party's objectives and tactfully convey them to the other party. Additionally, through better appreciation of the strengths and weaknesses of the other party's position and arguments, interest differentials may be identified more quickly and thus negotiations may move towards a more integrative solution. More specifically, the theories presented suggest that use of NSS can *improve* resource consumption, decision quality, perceived fairness, perceived satisfaction, and working relationships.

The theories outlined in this thesis are basic ones, and the experimental setting that has been suggested to evaluate the validity of these assertions is intended only as a framework and starting point for future research. The impact seen of NSS on the negotiation environment will be heavily dependent on further research in the field, and many of the expected effects will be realized only with continued advances in software and capabilities.

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